

OCULAR TRAUMA

First exclude

- Life threatening conditions
- Disability
- Orbital & skull base fractures
- Globe injuries

Chemical Burn

Only eye injury that requires
immediate TTT B4 HX &
careful OX

Immediate management

B4 HX & OX

- Copious **irrigation** with ?!!!! for 30 minutes until ...pH.
- **Double eversion...** remove particulate
- **Debridement** of necrotic epithelium
- **Clean water** can be used (TIME IS MORE IMPORTANT THAN TYPE OF SOLUTION)



| Acid | | |
|-------------------|--------------------------|--------------------------------------|
| Substance | Chemical Composition | Found in |
| Sulfuric acid | H_2SO_4 | Car batteries |
| Sulfurous acid | H_2SO_3 | Bleach and refrigerant |
| Hydrofluoric acid | HF | Glass polishing and mineral refining |
| Acetic Acid | CH_3COOH | Vinegar, glacial acetic acid |
| Hydrochloric acid | HCl | Swimming pools |

| Alkali | | |
|---------------------|--------------------------|--|
| Substance | Chemical Composition | Found in |
| Ammonia | NH_3 | Cleaning agents, fertilizers, refrigerants |
| Potassium Hydroxide | KOH | Caustic potash |
| Lye | NaOH | Drain cleaners, airbags |
| Magnesium Hydroxide | $\text{Mg}(\text{OH})_2$ | Firework sparklers, flares |
| Lime | $\text{Ca}(\text{OH})_2$ | Plaster, mortar, cement, white wash |

Chemical trauma

- **Alkali and acid burns**
- **Cement and Lyme:** NEVER WASHED
- **Tear gases:** cause marked lacrimation, burning and blepharospasm, near injuries may damage the cornea
- **Sulfur Mustard:** used in chemical warfare, causes skin blistering, respiratory problems and severe keratoconjunctivitis with corneal ulceration, opacification and vascularization

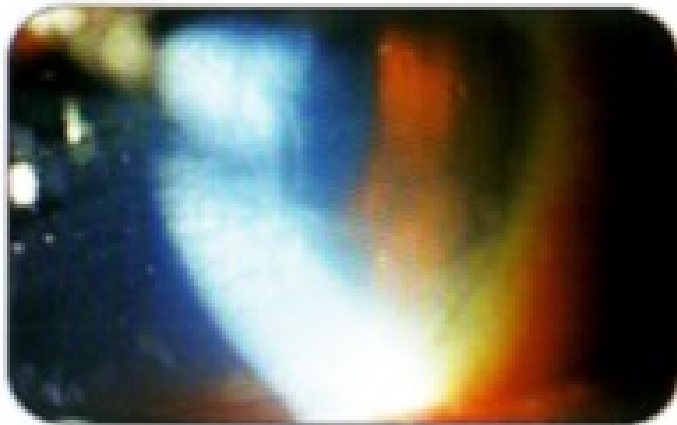
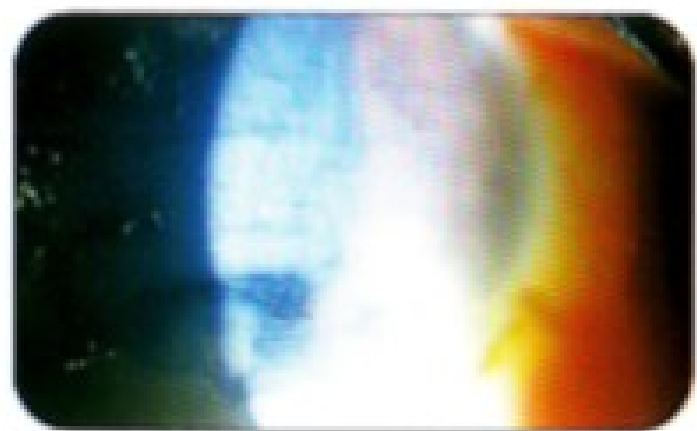
Grading

□ According to :

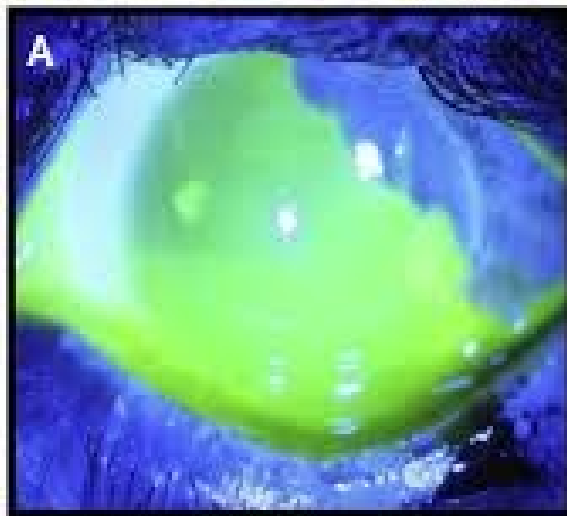
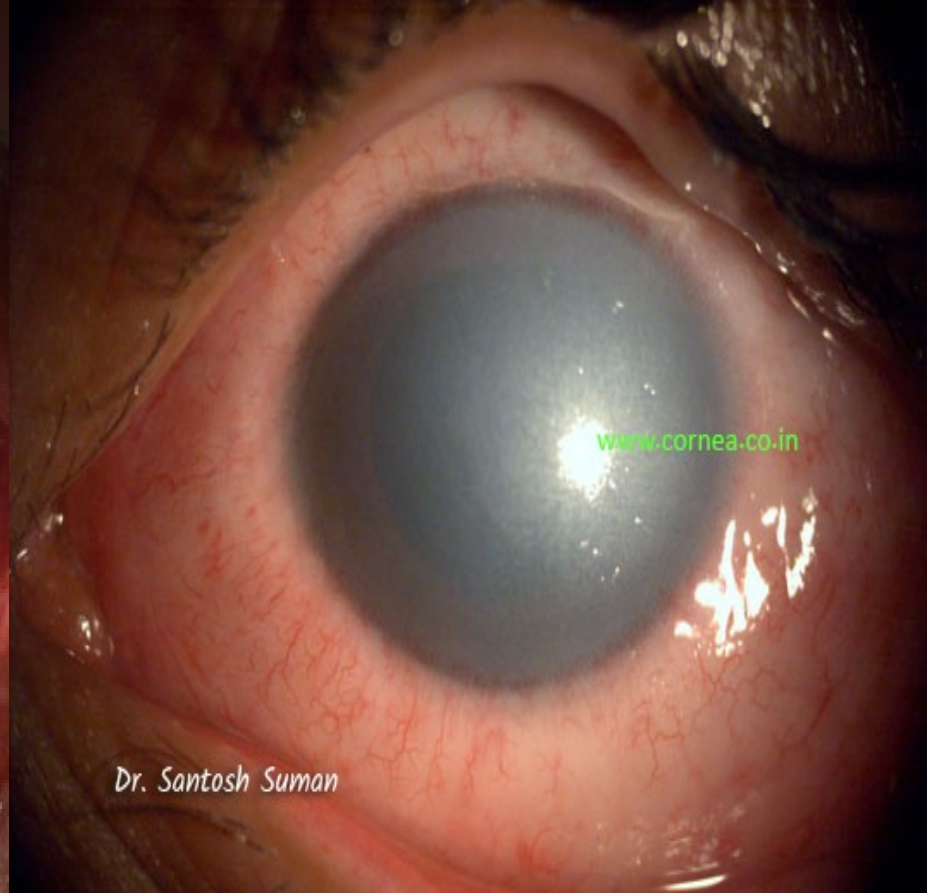
- **Clarity of the cornea** (iris visibility)
- **Limbal ischaemia**

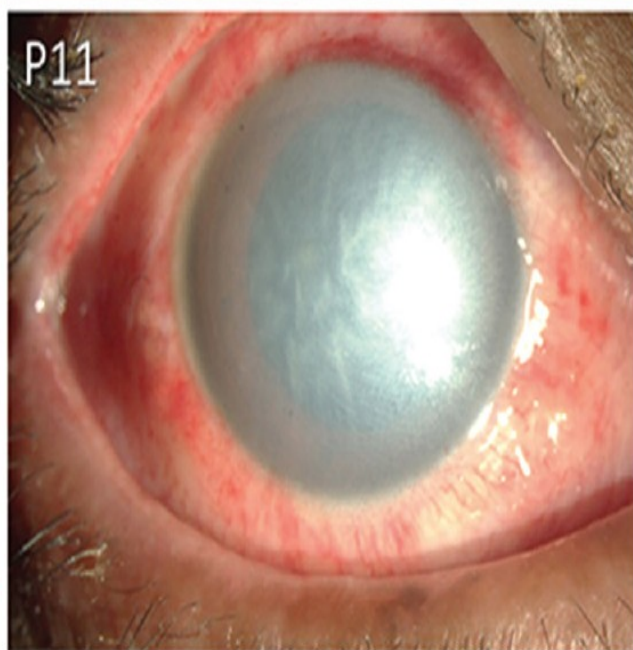
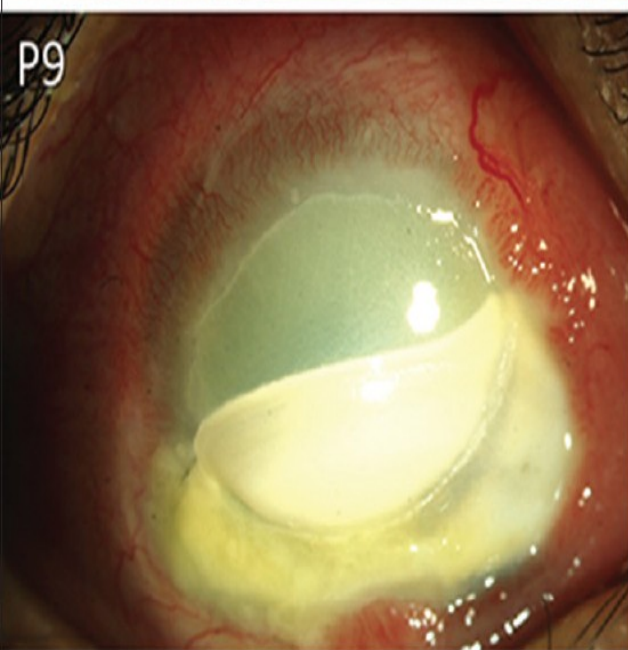
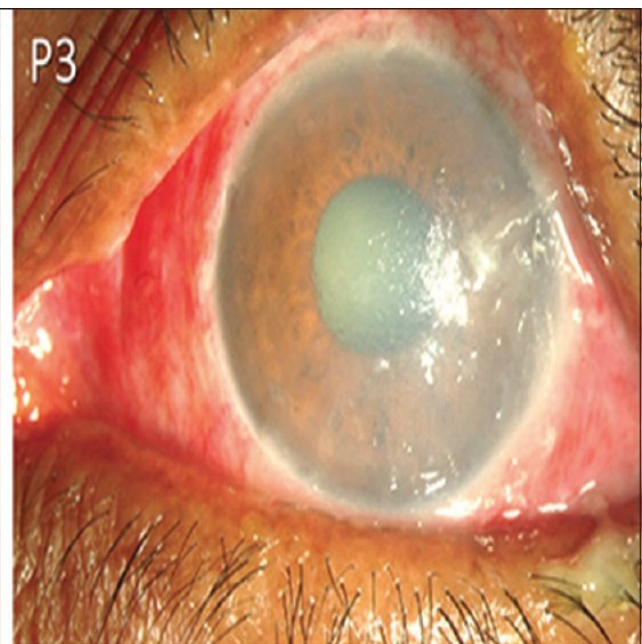
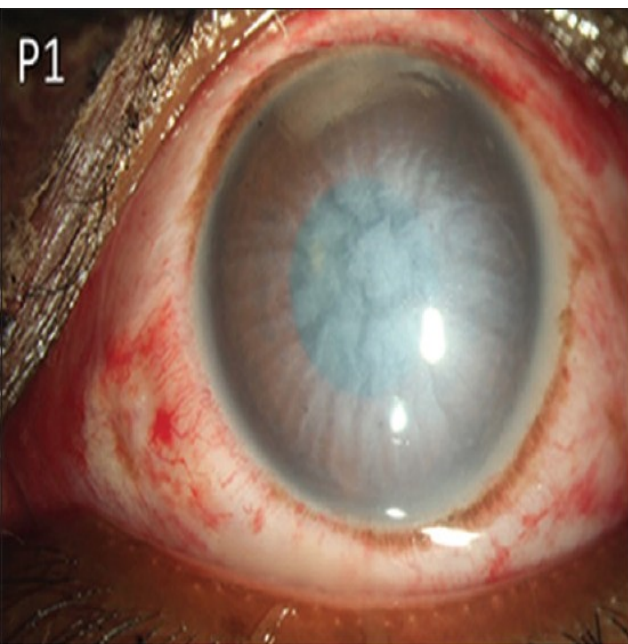
Hugh's classifications of chemical injury:

| grade | signs | prognosis |
|-------|--|-----------|
| I | <ul style="list-style-type: none">▪ Corneal epith. damage▪ No limbal ischemia | Excellent |
| II | <ul style="list-style-type: none">▪ Corneal haze but iris details seen▪ Ischemia less than 1/3 of limbus | Good |
| III | <ul style="list-style-type: none">▪ Corneal haze but iris details hazy▪ Ischemia <1/3 of limbus | Fair |
| IV | <ul style="list-style-type: none">▪ Opaue cornea▪ Ischemia >1/2 of limbus | Poor |



LIMBAL ISCHEMIA





Manage

I → II

☐ **Medical** for 1 wk:

- Topical steroids & cycloplegics for 7-10 days
- then NSAIDS
- Topical AB ointments
- Topical & syst. Ascorbic, citric & tetracycline

III → IV

☐ **Medical**

☐ **Surgical:**

- Early
- Late

☐ **Aim:**

- Decrease inflamm.
- Prevent ulceration
- Simulate regeneration

Surgical

Early

❑ Aim:

- Revascularization
- Restore LSC Limbal Stem Cell
- Re-establish fornices

➤ **Tenon advancement**

➤ **AMT**(amniotic membrane transplantation)

➤ **LSCT**(limbal stem cells transplantation)

➤ If perforation:

- Glue
- Patch graft

Late

❑ Conj:

Division of bands & symblepharon

❑ Lid:

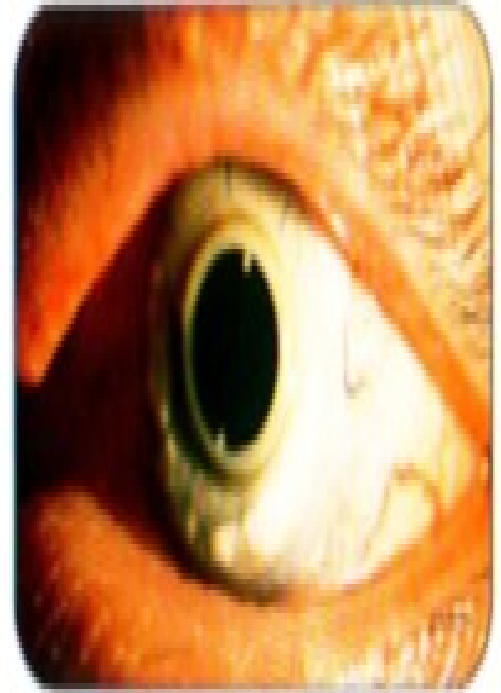
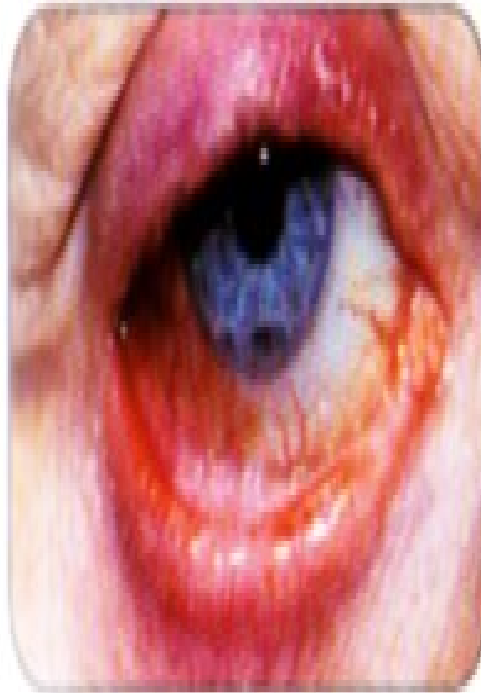
Correction of deformities

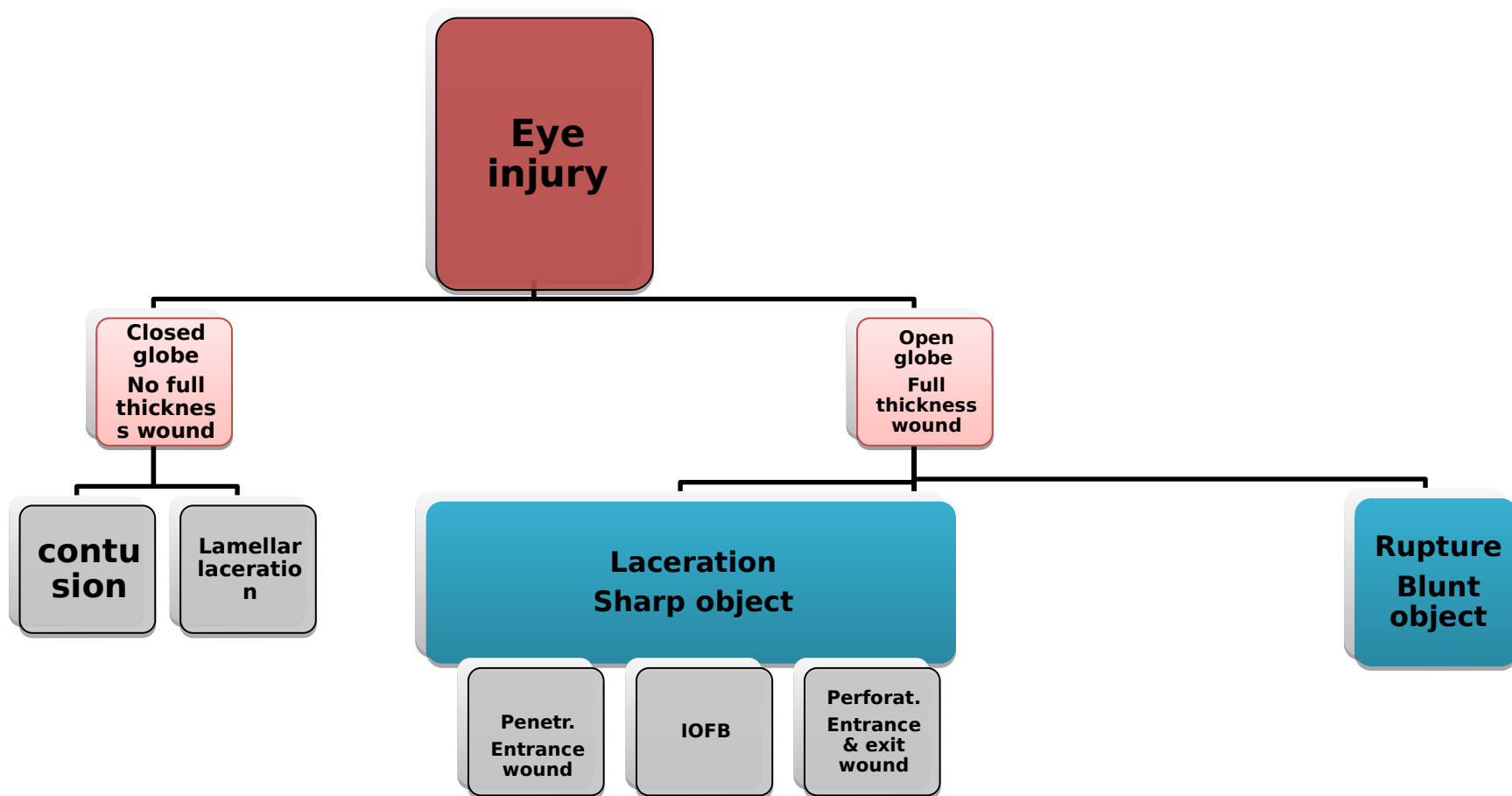
❑ Cornea:

- **PKP** (penetrating keratoplasty)....When?

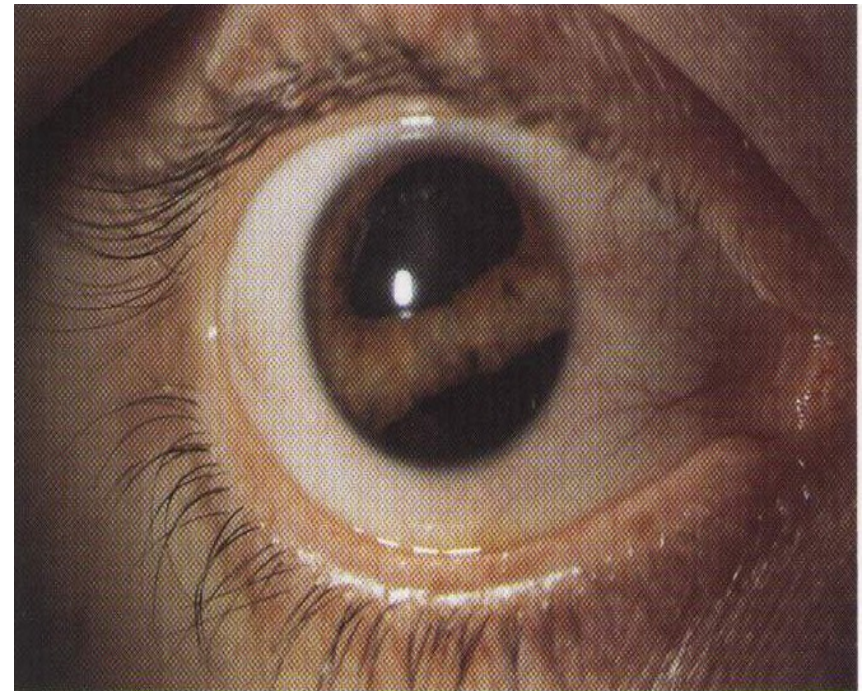
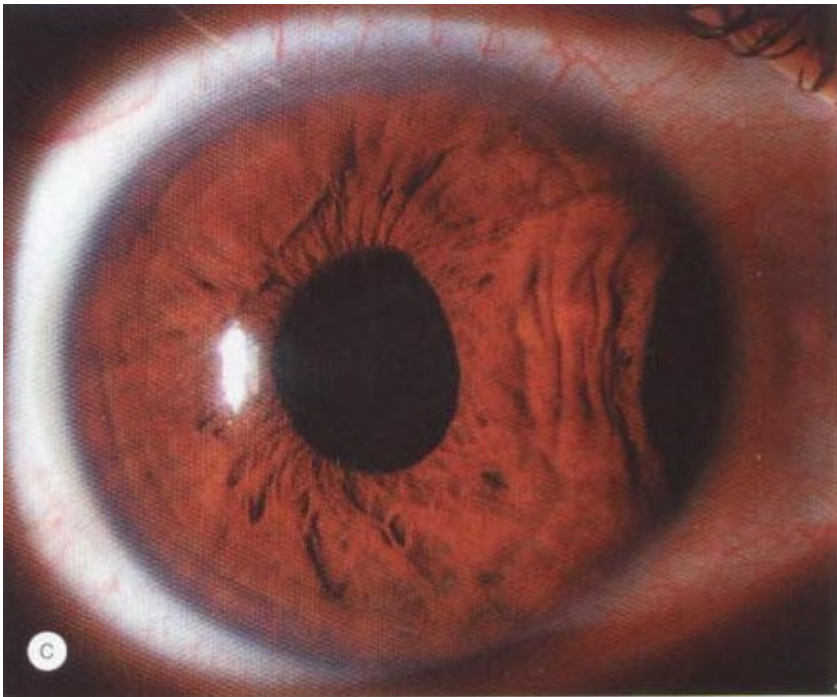
6 months

- Keratoprothesis





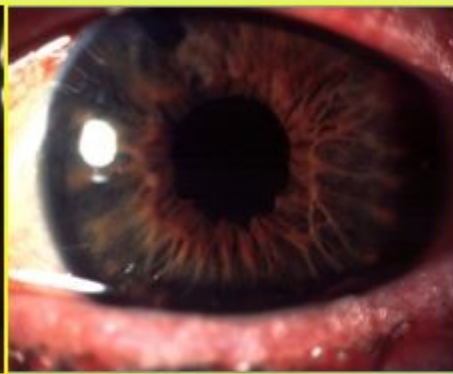
Iridodialysis



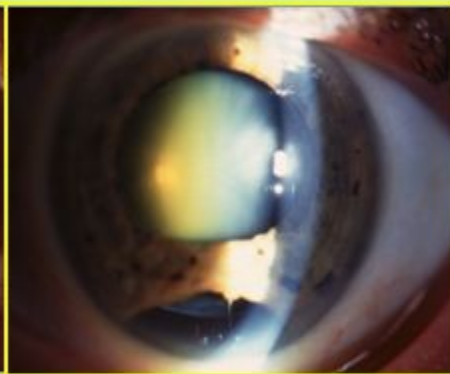
Anterior segment complications of blunt trauma



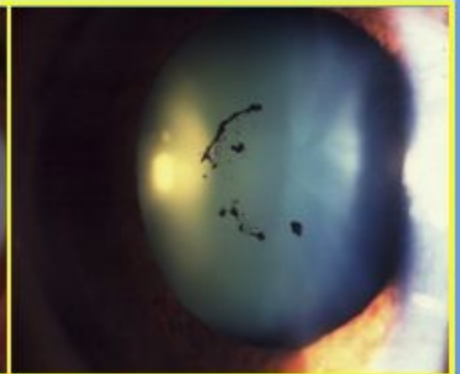
Hyphaema



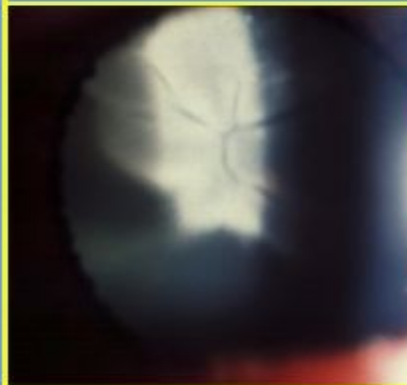
Sphincter tear



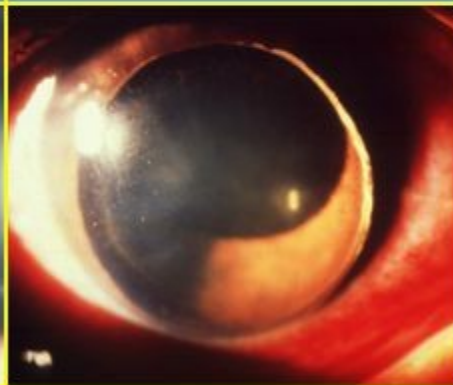
Iridodialysis



Vossius ring



Cataract



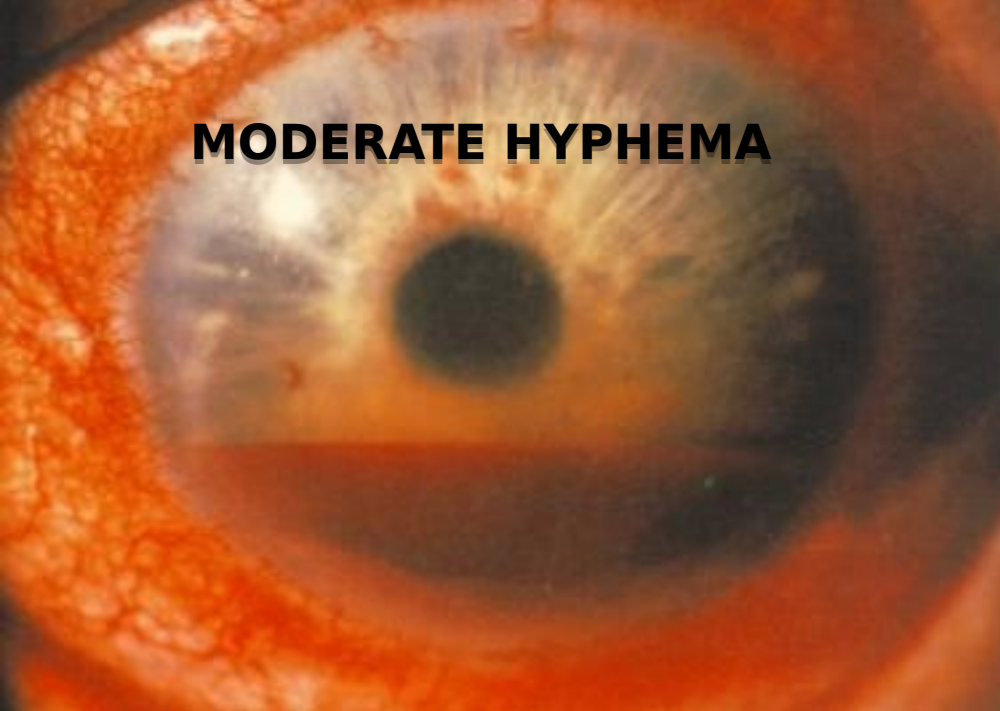
Lens subluxation



Angle recession



Rupture of globe



MODERATE HYPHEMA

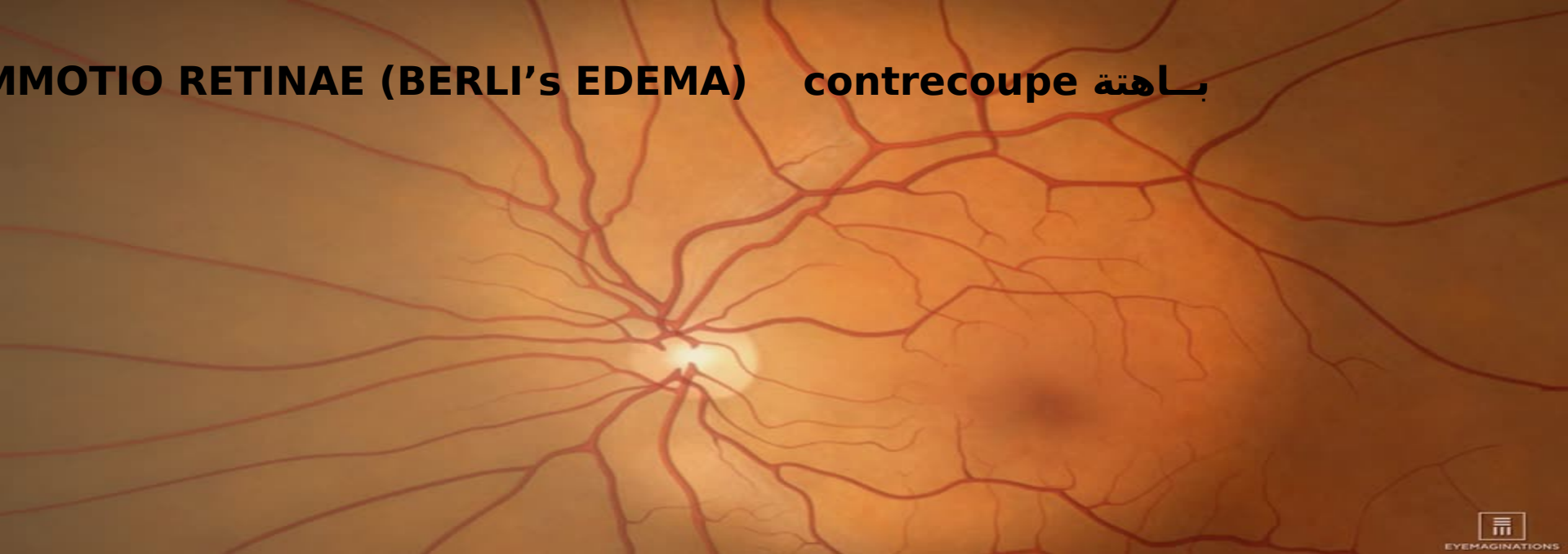


SEVERE HYPHEMA



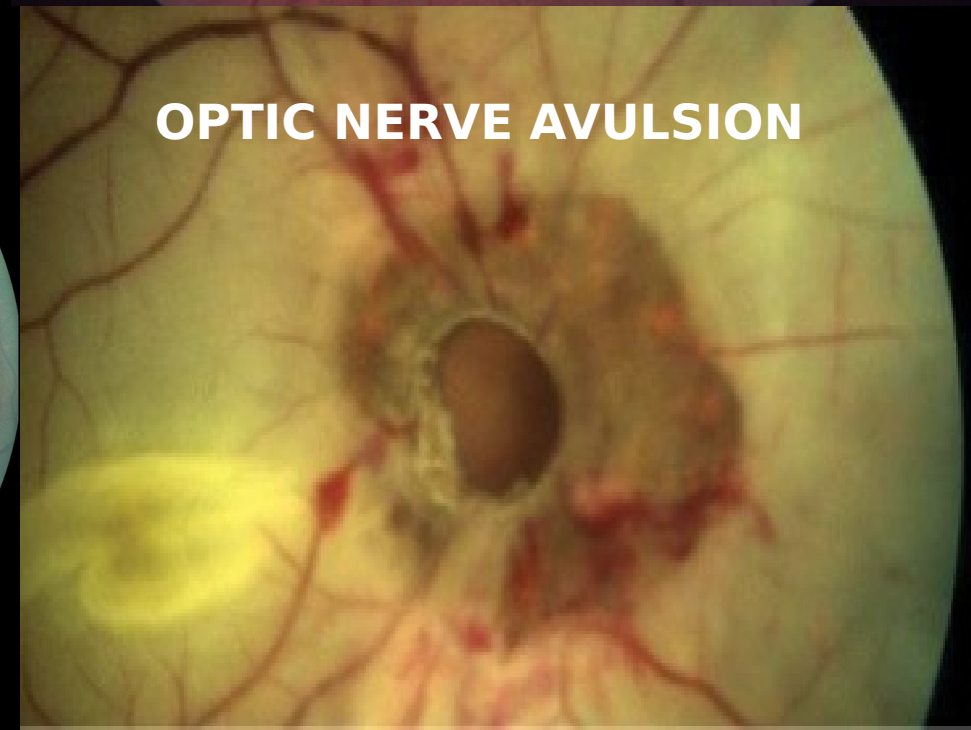
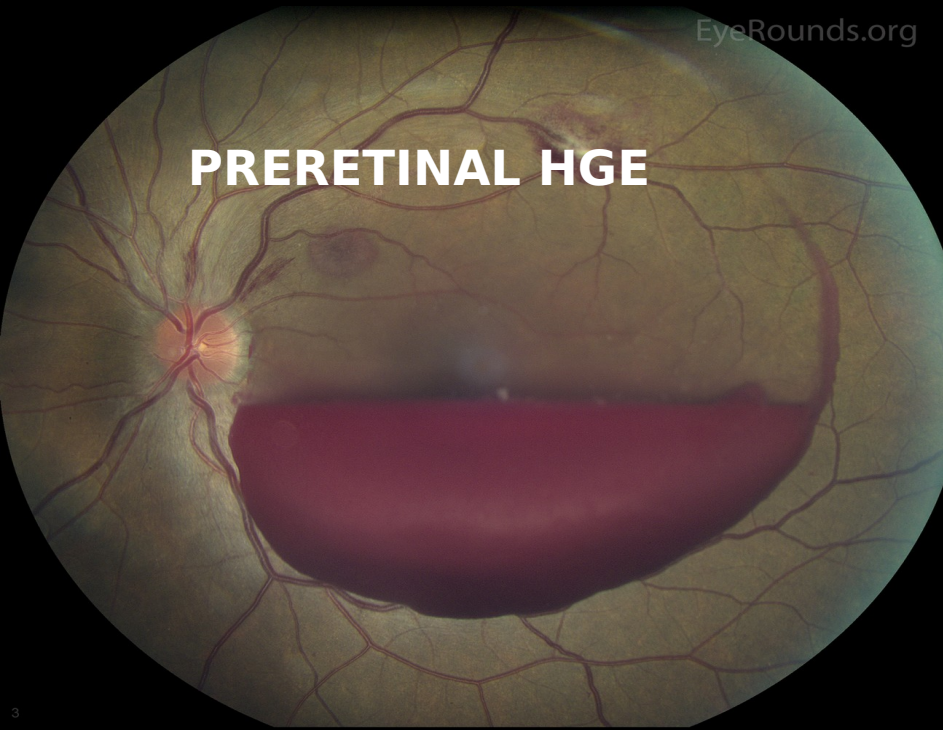
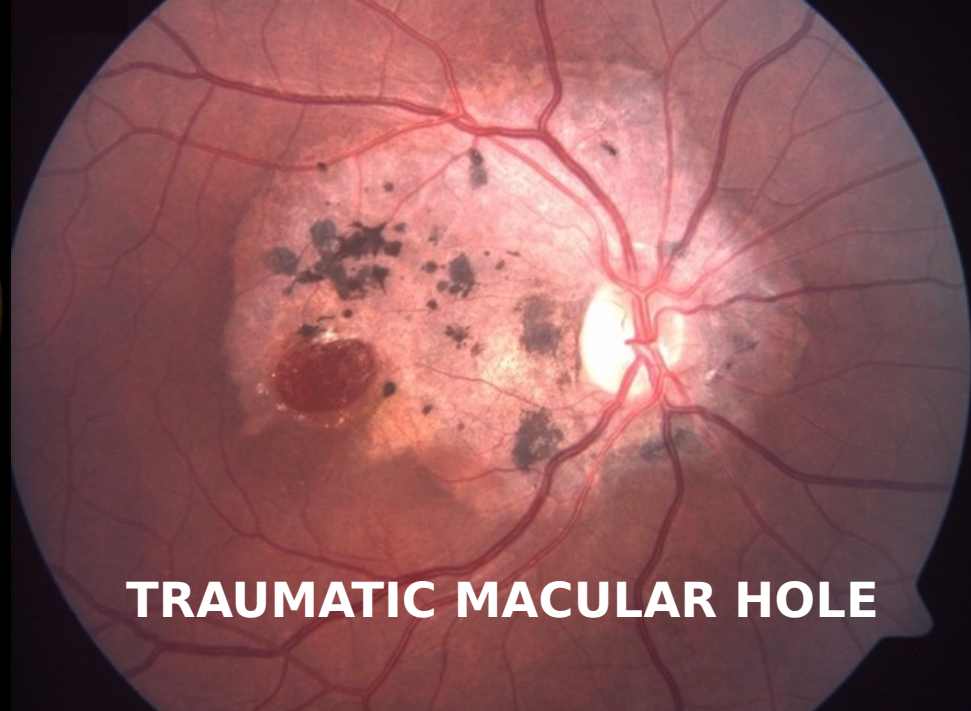
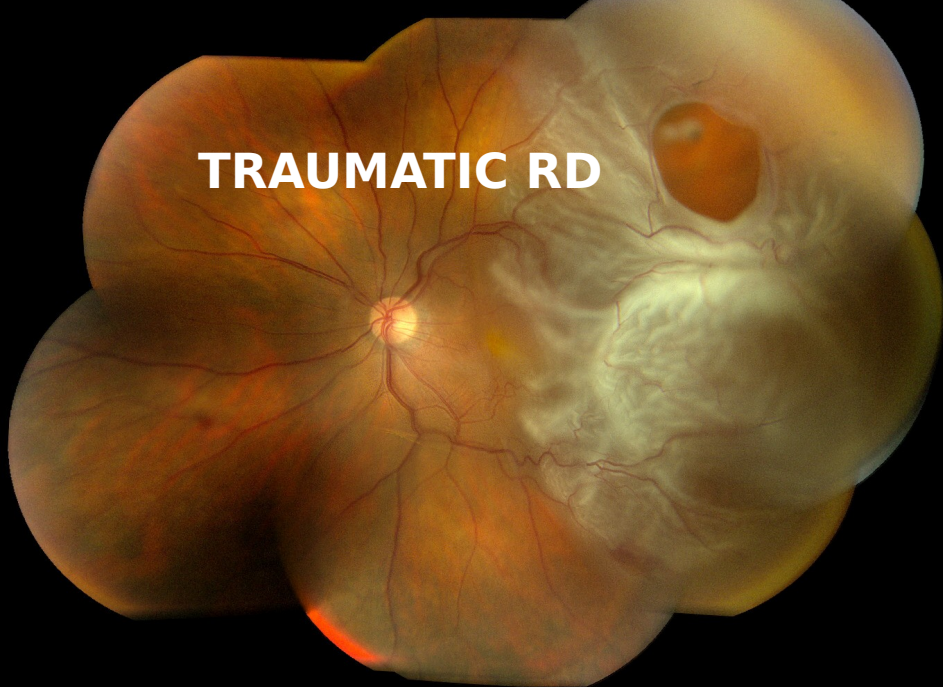
**CORNEAL BLOOD
STAINING**

IMMOTIO RETINAE (BERLI's EDEMA) باهته contrecoupe



BATTERED CHILD

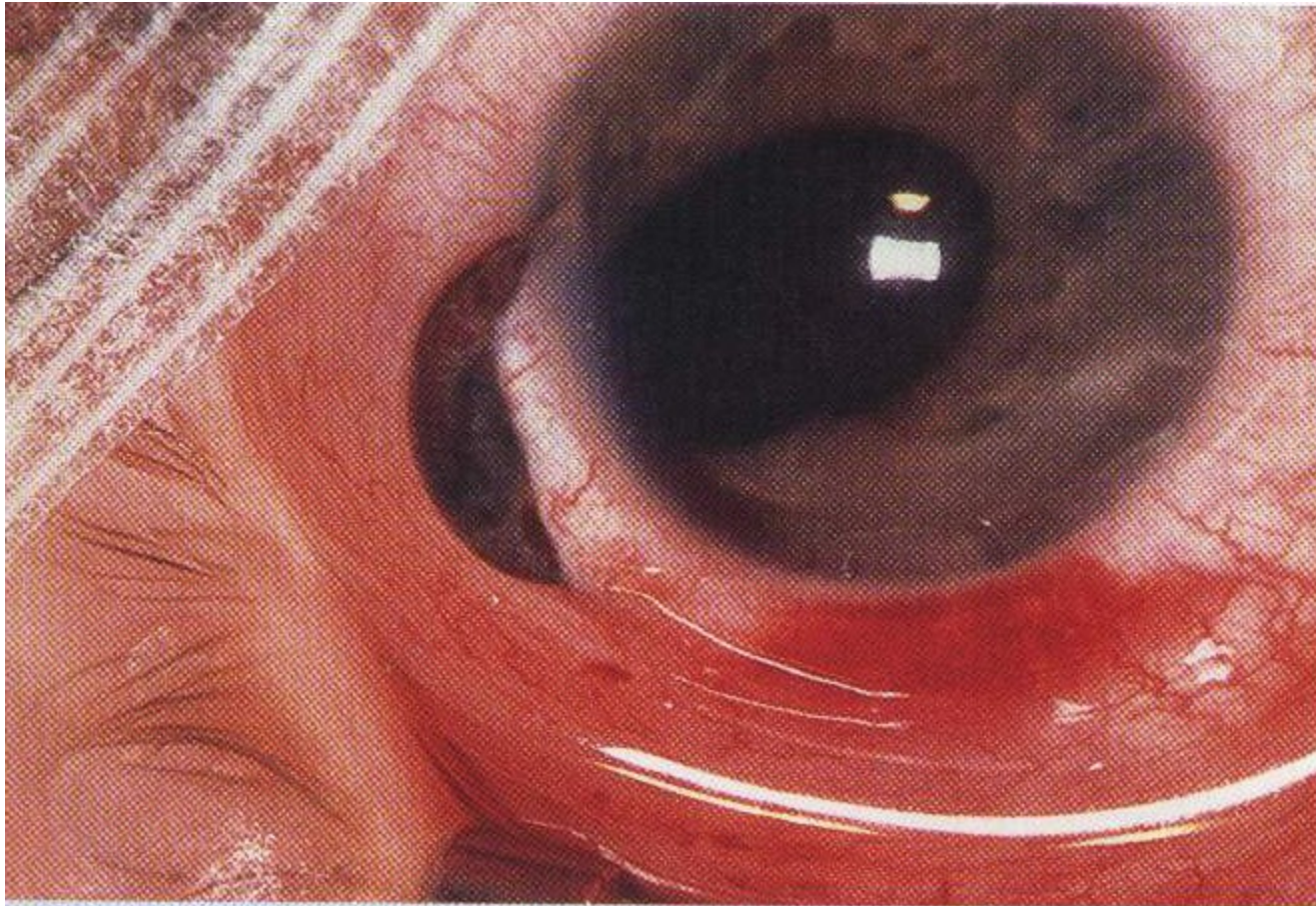




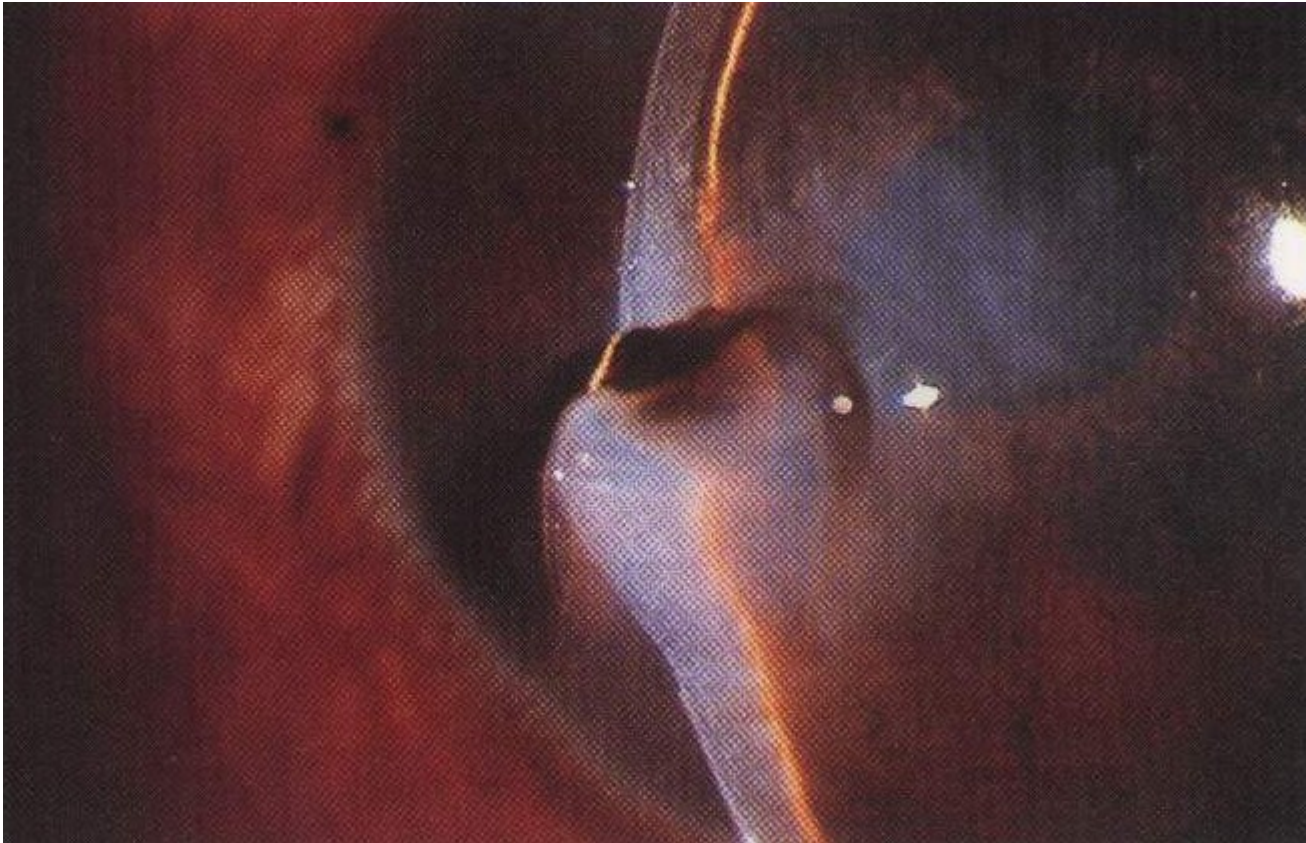
Car Accident

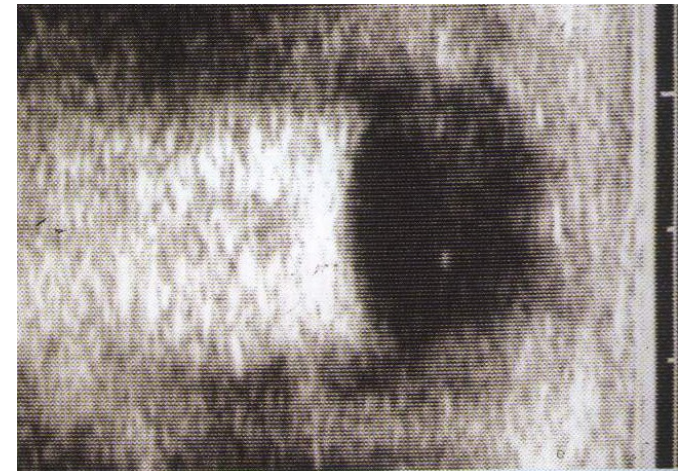
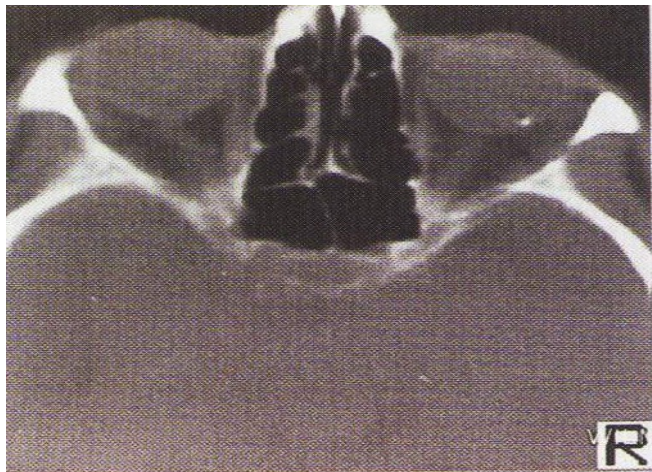
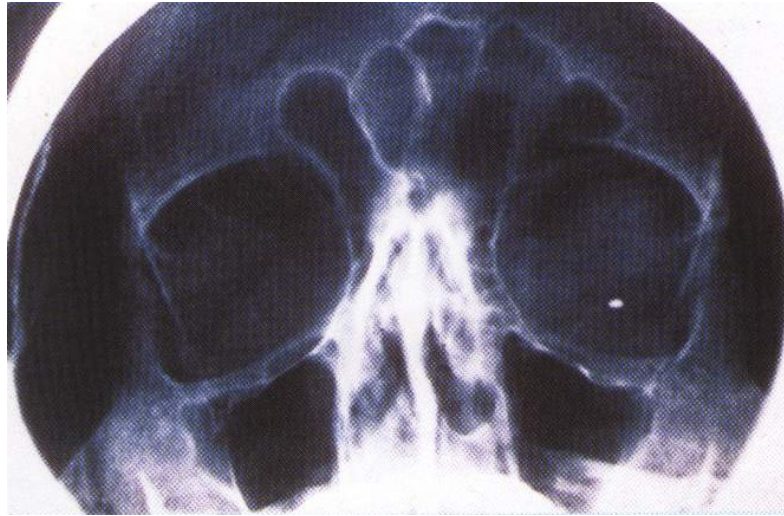


Scleral laceration with iridoscleral prolapse



Penetrating corneal wound with iris prolapse

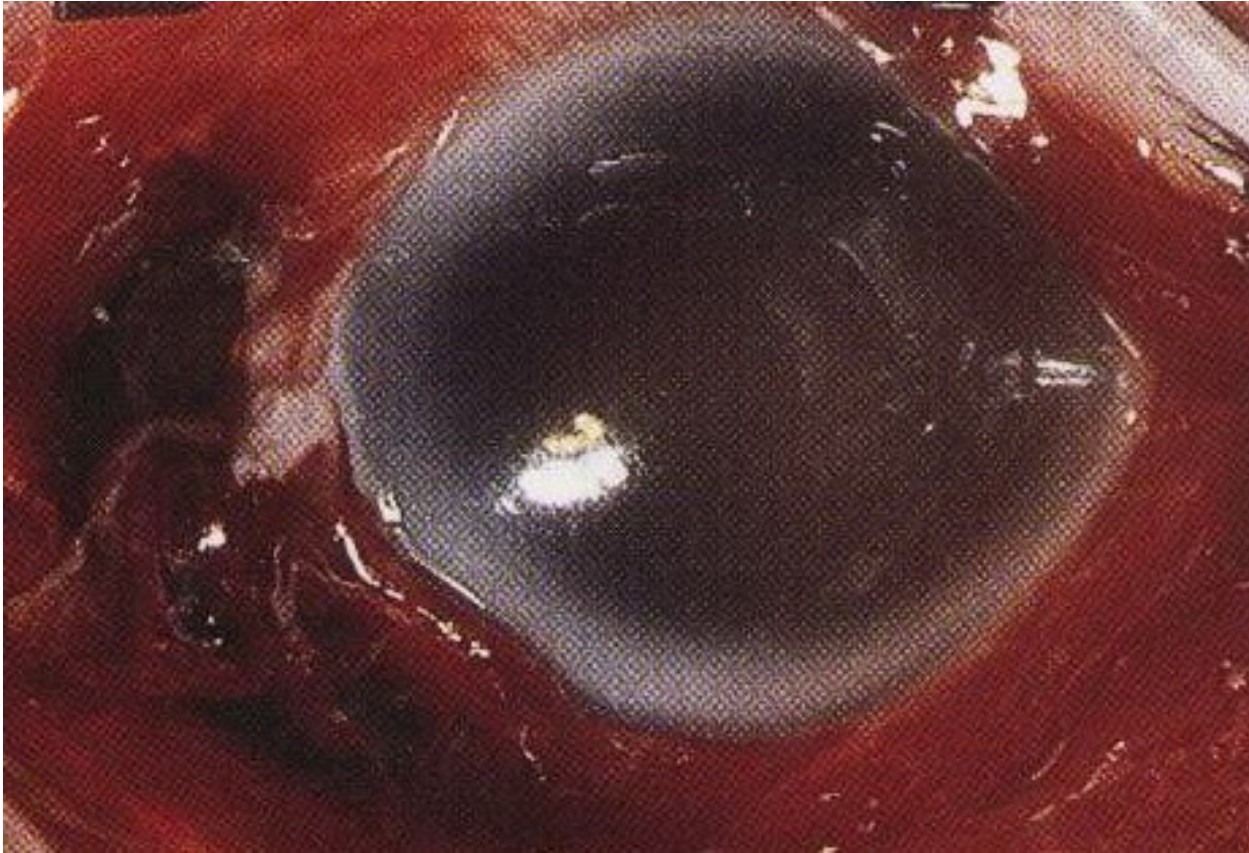




Corneal laceration with **cataract**



Rupture globe



Trauma case management

First exclude

- Lifethreatening conditions
- Globe injury
- IOFB esp hidden
- RBH retrobulbar Hg
- Infection

Second assess

- **Type**
 - Open or closed
- **Severity**
 - VA
 - RAPD
 - Extent

Work up of open globe injury

Management must be individualized

☐ A) history: (As usual paying attention to:)

- Object
- Time
- Last meal
- Tetanus status
- Pre-injury VA
- Other eye status

The principles of management are to assess severity of injury, exclude IOFB & infection, restore globe integrity & manage 2ry injuries.

☐ **Examination:**

➤ Principles:

- Gentle- avoid pressing
- Extent of damage
 - Partial or full thickness
 - Uveal prolapse
 - Lens damage

➤ Document: Draw

➤ Detect associated injuries

➤ Exclude IOFB

➤ Other eye status

☐ **Explain...**

☐ **NPO**

☐ **Admission**

☐ **ABIO**

☐ **INV:**

- CT scan,
- routine preop.

☐ **TTT:**

- Surgery
 - Consent
 - GA why?
 - Technique?..... Layers

Levels of management

❑ Operative:

- Restore integrity by surgical closure of the wound
- Minimal distortion of the globe anatomy
- 1ry repair is 1ry repair unless ...lens matter

❑ Post operative:

- Prevent infection
- FU for:
 - Wound
 - Complications: e.g.
 - Angle recession
 - Sediosis
 - SO palsy
 - delayed events & ttt

Levels of management

1. Anatomical integrity
2. Media clearance.. VH, cataract
3. FB removal
4. Prophylaxis against breaks & RD
5. FU for siderosis & SO palsy

Intraocular foreign body (IOFB)

Iron:

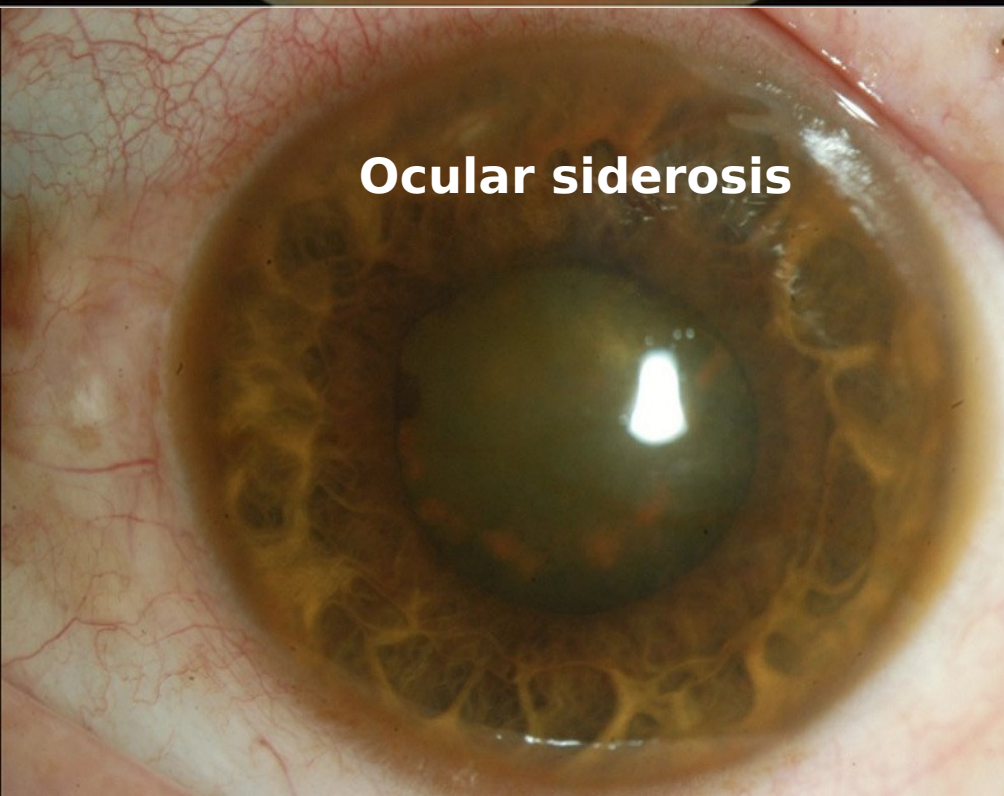
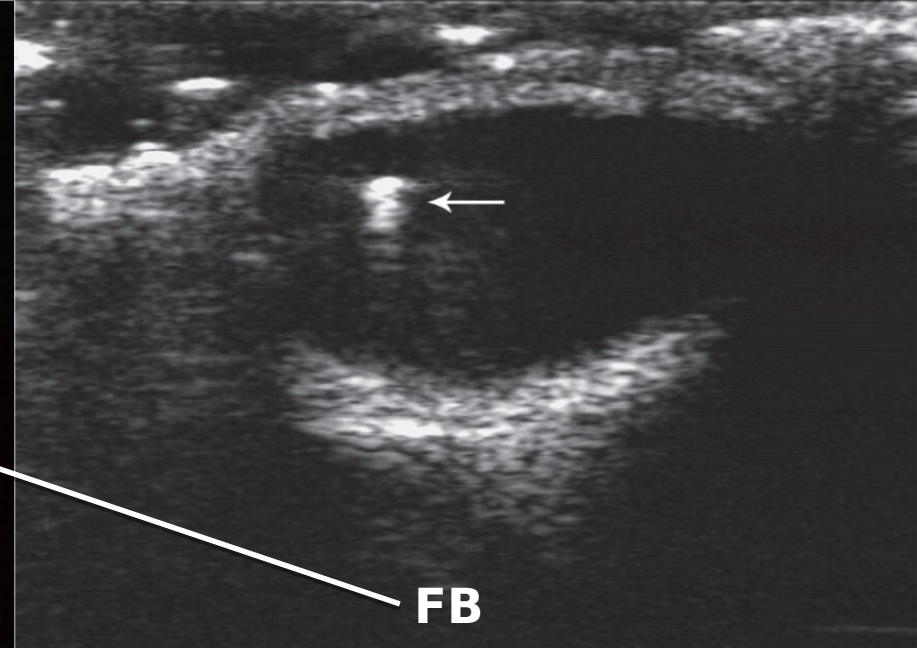
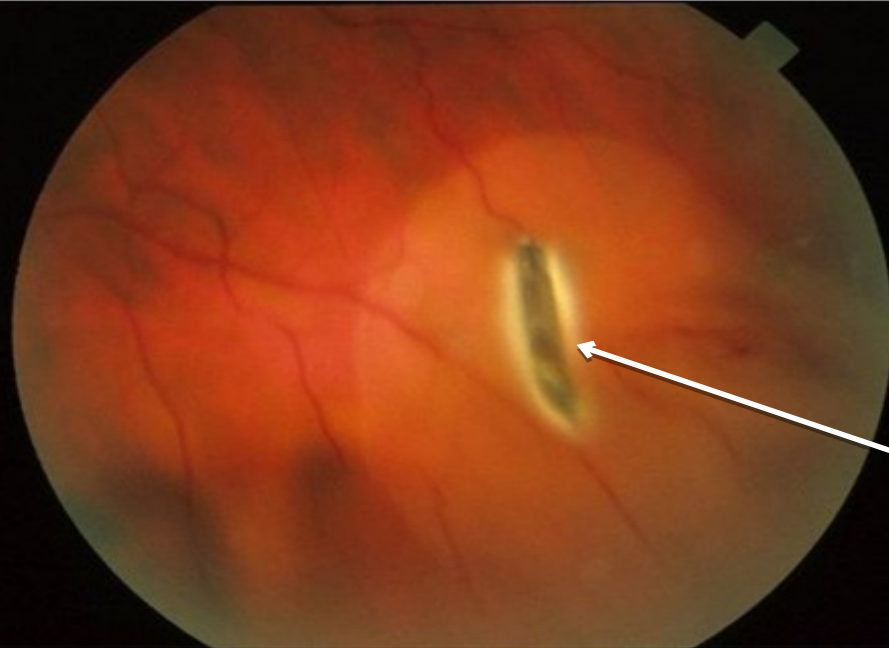
- FB (Siderosis) occurs months later with rusty discoloration of the iris and lens, secondary glaucoma, night blindness, retinal pigmentary changes and low ERG
- Infection is rare (heat generation)
- X-ray is done or ultrasound. CT scan is also useful
- **MRI** is **CONTRAINDICATED** if IOFB is SUSPECTED
- FB is removed by **vitrectomy**

☐ Copper (chalcosis);

acute stage ☐ picture of **sterile endophthalmitis**, later blue-green stain of ocular tissues

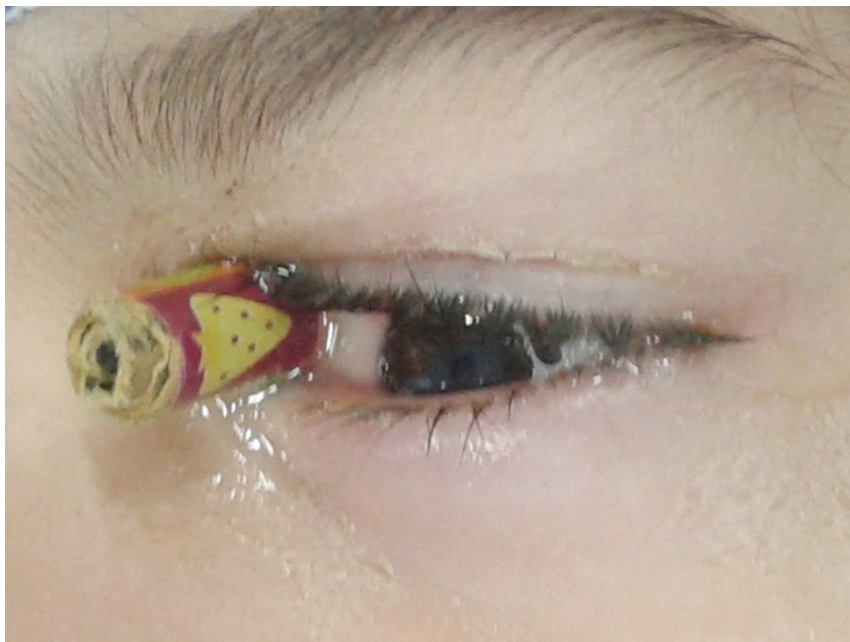
☐ Glass:

inert, small pieces can be **left inside the eye** if hard to remove



Removal of IOFB

- ❑ Removal of IOFB indicated if **injury is acute** (e.g. 24-48 hours)
- ❑ If patient present much later (e.g. 7 days) removal is indicated if:
 - Endophthalmitis is present
 - IOFB is toxic or organic
 - Associated VH
 - Impacted onto the retina
 - 2ry surgery is being considered (e.g. RD surgery)
- ❑ Otherwise can consider **leaving IOFB in situ**



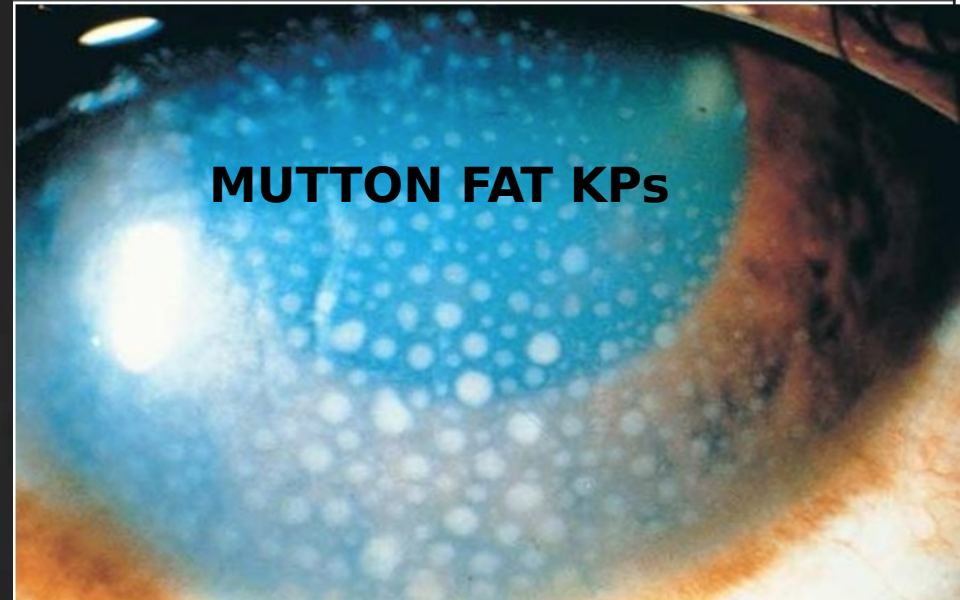
Sympathetic ophthalmia:

- an autoimmune disorder that results following physical or surgical trauma.
- Sequestered uveal antigens are released into the circulation followed by the development of autoantibodies.
- The autoantibodies attack the uveal tissue in both eyes resulting in **bilateral** chronic granulomatous uveitis.
- Sympathetic ophthalmia can be prevented by **enucleation of severely injured eyes** of no hope to repair.
- **Steroids/immunosuppressors** are the treatment for established sympathetic ophthalmia.

Sympathizing eye



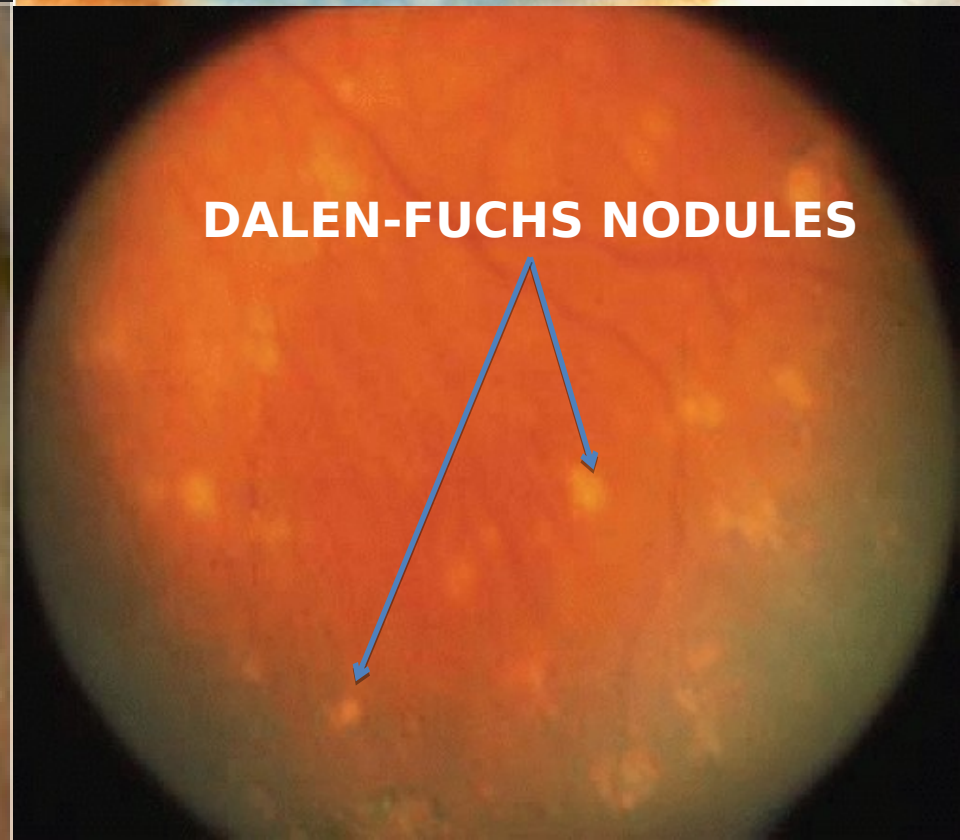
MUTTON FAT KPs



**END-STAGE SYMPATHETIC
OPHTHALMIA**



DALEN-FUCHS NODULES

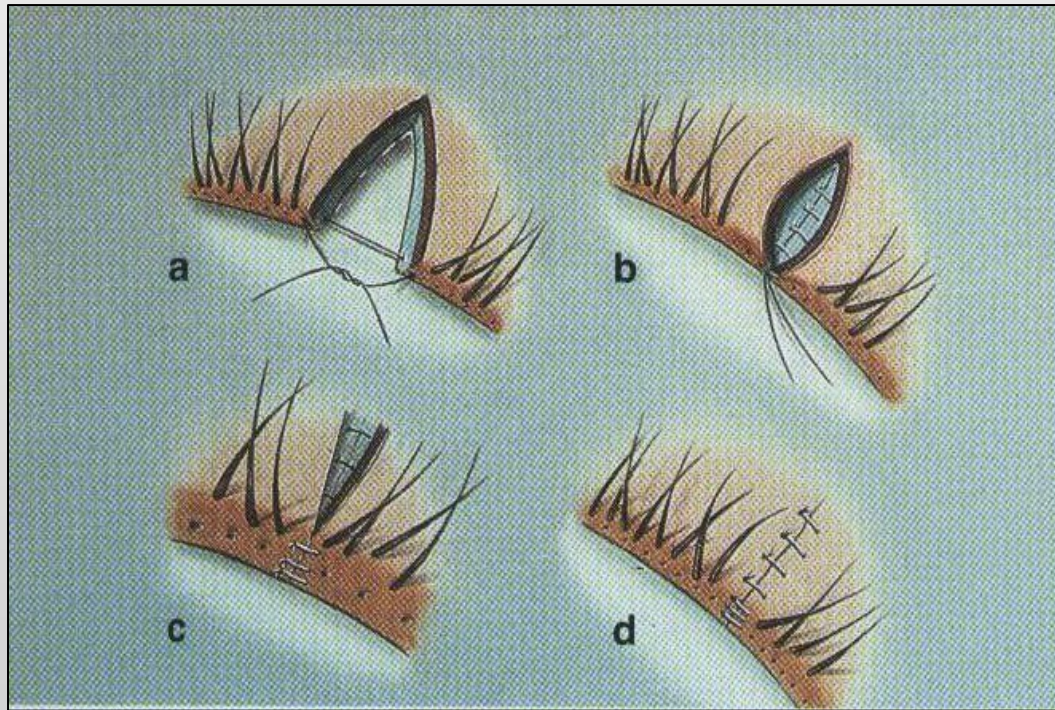


Eye lid laceration



Eye lid laceration

6-0 vicryl
6-0 black







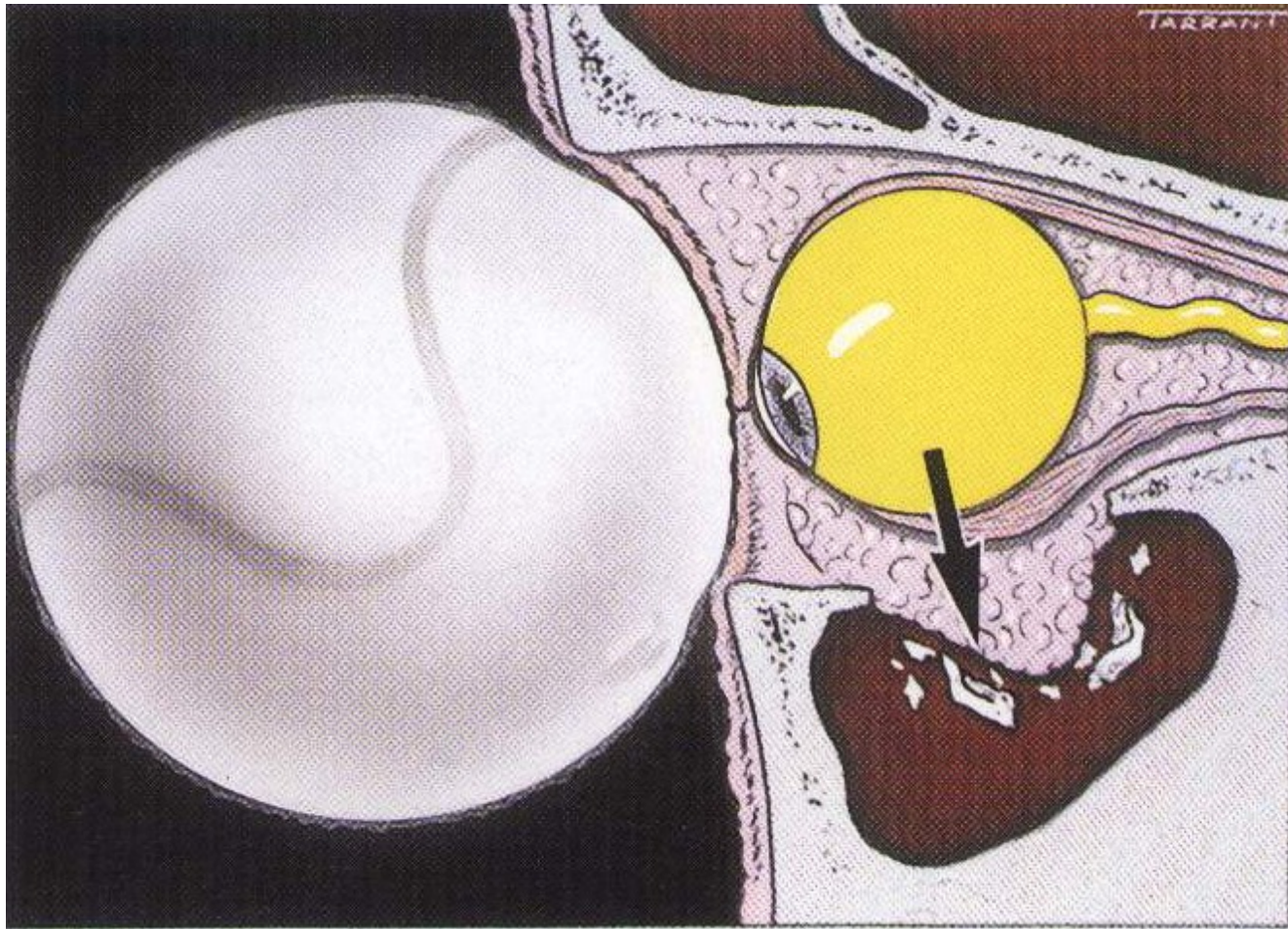


Tear Drop sign

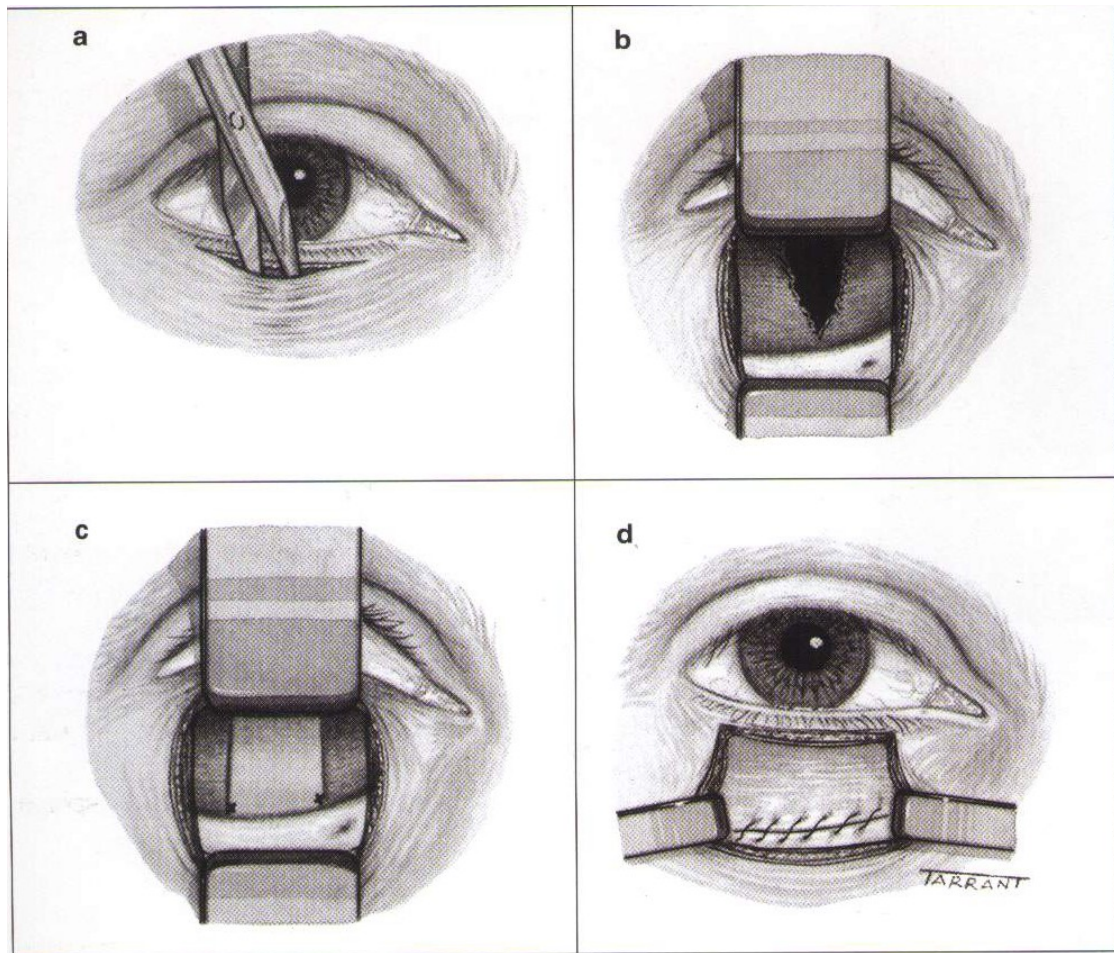


Right orbital floor blow out
fracture

Mechanism of blow out orbital floor



Surgical ttt of orbital floor blow out fracture



Blow out

☐ Exclude:.....

☐ History:..... diplopia

☐ Examination:

- VA
- SLE
- FDT
- Diff. IOP
- Motility
- Fundus
- Palpation
- Sensation on infra-orbital n

☐ Inv:

- X-ray (Water's view)
- CT coronal 1 mm cuts...**tear drop sign**
- Hess

☐ TTT:

- Conservative
- Surgical.. When?
- Early surgery ?

الحمد لله

